

SEX ATTRACTANT FOR *SCOPARIA BIPLAGIALIS*  
(LEPIDOPTERA: PYRALIDAE)

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*Abstract.*—(Z)-11-Hexadecen-1-ol acetate was discovered to be a sex attractant for *Scoparia biplagialis*. This is the first example of a sex attractant for Scopariinae.

During the last 15 years, a multitude of sex pheromones of insects have been identified (Inscoc, 1982). Sex pheromones are used in crop protection programs as attractants in traps which indicate the presence and change in population level of a target economic species. Also, sex pheromones are useful for studying taxonomic relationships (Roelofs and Brown, 1982).

In 1980, while conducting other research, we noted many specimens of a small species of moth in one of our traps, and we subsequently identified the species as *Scoparia biplagialis* Walker (Pyralidae: Scopariinae). In 1981 and 1982 we conducted further tests to confirm our observations and to determine the response of *S. biplagialis* to different amounts of the attractive compound. Here we report the results of the tests conducted in 1981 and 1982.

MATERIALS AND METHODS

Lures were prepared by adding 100  $\mu$ l of a dichloromethane solution of (Z)-11-hexadecen-1-ol acetate to No. 1 red rubber septa (West Co., Phoenixville, PA). The amount of acetate used was 0.0 and 1.0 mg per septum in 1981 and 0.0, 0.1, 1.0, and 10.0 mg per septum in 1982. Lures were placed in the bottom of wing traps (Howell, 1972) which had been coated with polyisobutyl-

ene to provide a sticky surface (Pherocon 1C® traps, Zocon Corp., Palo Alto, CA). Traps were hung at a height of 2 m in filbert trees. In 1981, one control and one test trap each were placed in two different abandoned orchards (Sherwood in Washington County and Dundee in Yamhill County) in the Willamette Valley, Oregon from 1 July to 27 August. In 1982 five replicates of the four treatments were arranged randomly along a row of filbert trees in the Sherwood orchard from 6 July to 24 August. In 1981, trap catches were recorded weekly and in 1982 on 22 July and 24 August. The 1982 data were analyzed by Duncan's New Multiple Range Test ( $P = 0.05$ ).

Insects were removed from the sticky traps

Table 1. Number of *S. biplagialis* captured in traps containing the lure (Z)-11-hexadecen-1-ol acetate, during tests conducted from 6 July to 24 August 1982 in the Willamette Valley, Oregon. Each dosage was tested with 5 replicates. Means followed by the same letter are not significantly different; ANOVA and DMRT ( $P = .05$ ).

Lure Dosage Trap (mg)	Catch/Trap and Significance
0	0 a
0.1	16.6 b
1.0	20.4 b
10.0	2.8 a

for taxonomic identification as follows. When the insects were to be examined from the dorsal view only, the cardboard surface to which they adhered was cut from the rest of the trap and the undisturbed insect was positioned on an insect pin. Insects selected for ventral and lateral views were freed from the sticky surface by washing several times with hexane. After soaking in hexane for 24 hours, the insects were placed on filter papers and transferred to a relaxing jar. When the specimens became soft, they were attached to minuten nadeln.

#### RESULTS AND DISCUSSION

In 1981 in both orchards the traps which contained (*Z*)-11-hexadecen-1-ol acetate captured *S. biplagi*alis (172 at the Sherwood orchard and 41 at the Dundee orchard). Neither control trap captured any *S. biplagi*alis. Over half of the captured *S. biplagi*alis were examined and all were found to be males. At Sherwood 163 (95%) and at Dundee 38 (93%) were caught by 6 Aug.

In 1982, the dosage tests (Table 1) showed that the traps containing 0.1 and 1.0 mg of (*Z*)-11-hexadecen-1-ol acetate per septum captured significantly more moths than the traps containing 10.0 mg or no lure. Of the 199 total, 121 (61%) were captured by the 22 July count. Based on the trap catches during 1981 and 1982, *S. biplagi*alis appears to have a major flight period during July and early August.

Munroe (1972) lists the immature forms of North American *Scoparia* as undescribed but notes that certain European species are known to feed underground on the roots of ragwort (*Senecio* spp.) and others are believed to tunnel in mosses. The noxious weed Tansy ragwort, *Senecio jacobaea* L., grows abundantly in western Oregon and Washington (Hepworth and Guelette, 1979) and is prevalent in both the Sherwood and Dundee abandoned orchards, and thus is a possible host.

According to Munroe (1972), *S. biplagi*-

*alis* is found widespread along the northerly parts of the continent that extends from Newfoundland to the Carolinas and westward across Canada and the northern one-half of the United States to the Pacific Coast and northward to the Aleutian Islands. He recognized five noticeably different populations and treated them as subspecies, based on the material from the following places: Natashquan, Quebec; Maine; Kaslo, British Columbia; Victoria, British Columbia; and Afognak, Alaska. The population in the Willamette Valley, Oregon, probably should be referred to *S. biplagi*alis *pacificalis* Dyar, originally described from Victoria, British Columbia, although Oregon could also have subspecies *fernaldalis*, or populations that are intermediate. Further taxonomic investigation is needed, as Munroe (1972: 41) indicated in his remark to the effect that some of the subspecies might really be species with poor morphological differentiation. This is the first example of a sex attractant for a species of the subfamily Scopariinae. In view of the great variation of size, coloration, etc., within *S. biplagi*alis and the extensive distribution of this species in northern North America, Z11-16:Ac may be helpful in solving taxonomic problems.

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